REMARKS

The Office Action dated June 3, 2008 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 26-37 and 41-56 are currently pending in the application, of which claims 26, 41, and 50-54 are independent. Applicants here amend claims 26, 41, and 50-54 to more particularly point out and distinctly claim the subject matter of the present application. It is respectfully submitted that the amendments add no new subject matter to the present application and serve only to place the present application in better condition for examination. It is believed that all grounds for rejection in the Office Action are currently addressed and that the present application is currently in condition for reconsideration in view of the amendments and the following comments. Entry of the amendments and reconsideration of claims 26-37 and 41-56 are therefore respectfully requested.

Referring to the Office Action, claims 26-37 and 41-56 are rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,272,522 (Lin) in view of a newly cited reference of U.S. Patent Publication No. 2003/0074388 (Pham). Please note that the Office Action wrongly identified Pham as U.S. Patent Publication No. 2003/00744388. The Office Action took the position that Lin allegedly discloses all recitations of the claims, except for the recitations of dependent claim 44, but that this deficiency is allegedly cured by Pham. However, as described in greater detail below, the combination of Lin and Pham neither teaches nor suggests each and every limitation

of independent claims 26, 41, and 50-54 and their dependent claims. Accordingly, this rejection should be withdrawn.

Claim 26, from which claims 27-37 depend relates to a method that includes obtaining a current connection state as well as a current load state of each of a plurality of processors configured to perform communication in a packet switched connection. Then, a load balancer configured to distribute load to said a processors selects, on a per packet basis, a processor in such a manner that a respective next packet is distributed to a processor having a lowest load irrespective of a specific connection to which this next packet belongs. Also, information is maintained about the load state of each processor so that said selecting is performed by selecting one of said processors to serve and process a respective packet based on the load state. The current connection state is informed to respective processors comprising inserting data indicating the current connection state into a packet to be distributed.

Claim 41, from which claims 42-49 depend, relates to an apparatus that includes storage configured to maintain a load state of each of a plurality of processors configured to perform communication in a packet switched connection. The apparatus further includes selection circuitry configured to select on a per packet basis, a processor on the basis of its load state in such a manner that a respective next packet is distributed to a processor having a lowest load irrespective of a specific connection to which this next packet belongs. Connection state informing circuitry informs the current connection state to respective processors by inserting data indicating the current connection state into a packet to be distributed.

Independent claim 50 relates to a system. An obtaining unit in the system is configured to obtain a current connection state as well as a current load state of each of a plurality of processors configured to perform communication in a packet switched connection from data storage. A selection unit in the system is further configured to select, on a per packet basis, by a load balancer configured to distribute load to said processors, a processor in such a manner that a respective next packet is distributed to a processor having a lowest load irrespective of a specific connection to which this next packet belongs. A maintenance unit is also configured to maintain information about the load state of each processor so that said selecting comprises selecting one of said processors to serve and process a respective packet based on the load states. Respective processors are informed of the current connection state by an information unit that inserts data indicating the current connection state into a packet to be distributed.

Independent claims 51 relates a computer program embodied on a computer readable medium, where the computer readable medium storing code comprising computer executable instructions configured to perform a method that includes obtaining a current connection state as well as a current load state of each of a plurality of processors configured to perform communication in a packet switched connection. Then, a load balancer configured to distribute load to said a processors selects, on a per packet basis, a processor in such a manner that a respective next packet is distributed to a processor having a lowest load irrespective of a specific connection to which this next packet belongs. Also, information is maintained about the load state of each processor so that said selecting is performed by selecting one of said processors to serve and process a

respective packet based on the load state. Respective processors are informed about the current connection state by inserting data indicating the current connection state into a packet to be distributed.

Independent claim 52 relates to a system that includes data storage and processors for performing communication in a packet switched connection. Also, at least one load balancer is configured to distribute the load to the processors. Also the load balancer is configured to obtain a current connection state and a current load state of each of said processors; maintain information about the load state of each of said processors; and select a processor in such a manner that a respective next packet is distributed to a processor having a lowest load irrespective of a specific connection to which a respective packet belongs by selecting one of the processors to serve and process a respective packet based on the load state. Respective processors are informed about the current connection state by inserting data indicating the current connection state into a packet to be distributed.

Independent claim 53 relates to a load balancer configured to obtain a current connection state and a current load state of each of a plurality of processors and to maintain information about the load state of each of said processors. The load balancer is further configured to select a processor on a per packet basis in such a manner that a respective next packet is distributed to a processor having a lowest load irrespective of a specific connection to which this next respective packet belongs by selecting one of the processors to serve and process a respective packet based on the load state of the selected

processor. Respective processors are informed about the current connection state by inserting data indicating the current connection state into a packet to be distributed.

Independent claim 54, from which claims 55 and 56 depend, relates to an apparatus that includes maintaining means for maintaining a load state of each of multiple processors performing a packet switched communication connection. The apparatus also includes selecting means for selecting, on a per packet basis, one of the processors on the basis of its load state in such a manner that a respective next packet is distributed to a processor having a lowest load irrespective of a specific connection to which a respective packet belongs. Informing means inform respective processors about the current connection state by inserting data indicating the current connection state into a packet to be distributed.

Each of the above-described independent claims recited limitations that are not disclosed or suggest by Lin or Pham, either alone or in combination.

As described in Applicants prior Response dated February 18, 2008, both the present application and Lin relate to load balancing by a controller among packet processing devices in a packet switched communication, but as described in greater detail below, Lin discloses load balancing on a "per-connection" basis, whereas the present application considers this on a "per-packet" basis.

Although this distinction was identified in the previous Response, the Office Action was reluctant to acknowledge this difference. Specifically, the Office Action refers to the abstract of Lin, which stated that "the switching processors re-write the routing information included in the header portion of the data packets to reflect the

selected one of the external networks." However, as described in greater detail below, this statement does not refer to a load balancing of the switching processors, but rather to a routing process of respective packets.

Referring, for example, to claim 26, Applicants urge that Lin does not disclose or suggest the limitation of "informing the current connection state to respective processors by inserting the same into a packet to be distributed". This feature is described, *e.g.*, in paragraphs [0016]-[0017] and [0034] of the corresponding publication of the present application.

As described above, Lin does not disclose a per-packet load balancing as already discussed earlier, and this deficiency is admitted in the Office Action vis-à-vis claim 44 in which the Office Action relied on Pham for this feature. Thus, Lin does not teach or suggest the feature due to this limitation of informing the current connection state to respective processors by inserting the same into a packet to be distributed.

Applicants further urge that Lin also does not teach or suggest the limitation in claim 26 that a processor having a lowest load (e.g. "free") is selected for processing the next packet irrespective of the specific connection to which this next packet belongs, as described for example, in paragraphs [0009], [0014], and [0034] of the corresponding publication of the present application. Thus, Applicants respectfully note that the present application the pending claims clearly relate to load balancing on a per-packet basis.

In contrast, Lin sets forth that the disclosed load balancing is based on a per-connection basis. For example, Lin discloses in Fig. 3 "a control processor to perform network load balancing" (col. 3, l. 34), where it is described in detail in col. 6, ll. 12-28, that: "each respective one of the switching processors 44_1 and 44_2 poll corresponding ones of the plural network interfaces 37_1-37_3 for incoming data packets 20 present on their respective receive queues....Since each of the switching processors 44_1 and 44_2 poll different ones of the network interfaces 37_1 -37_3." Thus, according to Lin, one switching processor polls a whole packet queue and not only a single packet so that the load balancing is clearly being effected on a per-connection basis.

Likewise, Lin discloses a switching processor 44, depicted in Fig. 4, that includes a packet engine module 72 and a packet filter module 74, and the actions performed by these modules are depicted, respectively, in Lin at FIGS. 5 and 6.

Specifically, in consideration of the loop designated with reference numeral 112 in FIG. 5, Applicants note that a next packet processed by the packet engine module 72 of the switching processor 44 is taken from the same packet queue. See, also, Lin at col. 8, ll. 42-48, that discloses that the disclosed method includes "determine[ing] whether additional packets are present at the network interface receive queue. If additional packets are present, the packet engine module 72 returns to step 108 and the second processing loop is repeated." Thus, if only one packet queue would be present at any of the network interfaces according to the above-described disclosure in Lin, all packets of this queue would be processed by the same

switching processor, whereas according to certain embodiments the present invention, the packets of this queue would be distributed to all switching processors, such as in a round-robin fashion.

As indicated above, the statement of the abstract to which the Office Action erroneously references is specifically related to the routing of the packets which is performed by the packet filter module 74. See, for example, col. 8, ll. 40-41, that describes that "the retrieved data packet is passed to the packet filter module 74 for routing."

In this way, this routing is actually described in connection with FIG. 6 of Lin that is, inter alia, described in col. 9, ll. 3-48. In this connection, Applicants note that this description cannot be mistaken as describing a packet-based load balancing, since the process clearly distinguishes its actions "whether the data packet is a new connection with the client" (see, col. 9, ll. 4-5) in which case "the packet filter module 74 may elect to send the data packet to the application server having the lightest current load" (see, col. 9, ll. 13-15), or "if it was determined ... that the received data packet was not a new connection with the client" (see, col. 9, ll. 33-34) in which case "the application server and application that is already servicing the connection" (see, col. 9, ll. 43-44) is selected.

Thus, Applicants respectfully urge that it is clear that Lin discloses load balancing on a per-connection basis which suffers from the drawbacks of the conventional distribution techniques described in the present application, for example, at paragraphs [0004] and [0005].

Continuing with claim 26, in contrast to the description of Lin, the recited embodiment of the present application is based on a per-packet load distribution involving the advantages set forth in the section "summary of the invention" of the present application. Also, Lin does not disclose or suggest the limitation that respective processors are informed about the current connection state by inserting data indicating the current connection state into a packet to be distributed. Accordingly, the embodiment of the present application as recited in claim 26 offers significant technical benefits over Lin.

Although not relied upon in the Office Action in the discussion of claim 26, Applicants further urge that Pham does not cure the above-described deficiencies in Lin. Specifically, Pham relates to a network gateway processor architecture that includes a scalable array of compute processors that function to convert inbound data packets to outbound data packets, an ingress processor coupleable to a first network to receive the inbound data packets and coupled to provide the inbound data packets to the compute processors, and an egress processor coupleable to a second network and coupled to the compute processors to collect and forward the outbound data packets to the second network. The ingress processor distributes inbound data packets to the compute processors based on a least load value selected from current load values determined for the respective compute processors of the scalable array. The current load values represent estimated processing completion times for the respective compute processors of the scalable array of compute processors. Preferably, the current load values are dynamically derived

with respect to the size of the inbound data packets and the performance of the respective compute processors.

Thus, Pham does not show or suggest that respective processors are informed about the current connection state by inserting relevant data into a packet to be distributed.. For example, Pham discloses in paragraphs [0051] -[0053]that processors share information using a shared memory, and not via a distributed processor as recited in claim 26.

Because the combination of Lin and Pham neither teaches nor suggests each and every limitation contained therein, claim 26 is consequently allowable over the cited references. Claims 27-37 depend from claim 26, and because they include every limitation recited therein, are likewise allowable over Lin and Pham on similar basis. Independent claims 41 and 50-54, although of different in scope and although rejected in view of different sections of Lin and Pham than claim 26, recite similar limitations as related to a per packet basis of load balancing and should likewise be allowable for similar reasons. Dependent claims 42-49 claims should similarly be allowable as depending from allowable claim 41, and dependent claims 55-56 claims should similarly be allowable as depending from allowable claim 54. Reconsideration of the all the pending claims and allowance thereof is respectfully requested.

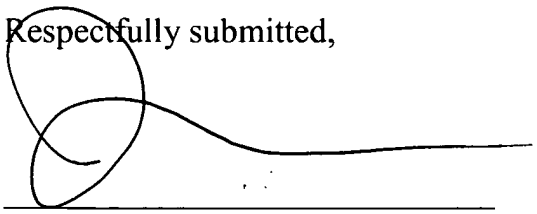
In conclusion, as discussed above, each of the pending claims now recites subject matter which is neither disclosed nor suggested in the cited prior art references. Applicants submit that the recited subject matter is more that sufficient to render the recited embodiments of the present invention non-obvious to a person of ordinary skill in

the technical art of telecommunications. It is respectfully requested that claims 26-37 and 41-56 be allowed in view of the above arguments, comments, and remarks and the application padded to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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